

Towards a Phygital Heritage approach for Museum Collection

Original

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ICAS-EMME 2

**Second International Congress on Archaeological Sciences
in the Eastern Mediterranean and the Middle East**

12-14 November

The Cyprus Institute, Nicosia, Cyprus



CAARI
Cyprus American Archaeological
Research Institute



Πανεπιστήμιο Κύπρου
University of Cyprus



ΤΜΗΜΑ ΑΡΧΑΙΟΤΗΤΩΝ ΚΥΠΡΟΥ
DEPARTMENT OF ANTIQUITIES CYPRUS



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FOUNDATION



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Edited by

Artemios Oikonomou and Thilo Rehren

The Cyprus Institute, Nicosia, Cyprus

2019

From a very early stage of his professional life, **Professor Vassos Karageorghis** has been a staunch supporter of what Archaeological Sciences can do for archaeology, realizing (in his own words) '*that without them we cannot make any real progress in our research*'. However, without the acceptance of what the sciences have to offer, demanding that they address archaeological questions, and providing the intellectual and structural climate to enable their full integration into archaeology, Archaeological Science would be void of purpose. Professor Karageorghis provided all this, and so much more, as part of his life-long work to establish archaeology in all its facets in Cyprus, as a Cypriot endeavor.

We are deeply honoured that he accepted our dedication of ICAS-EMME 2 to mark his recent 90th birthday anniversary.

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Foreword

We are delighted to welcome you to the 2nd International Congress on Archaeological Sciences in the Eastern Mediterranean and Middle East, or ICAS-EMME 2 for short. We are proud to host nearly 100 presentations on a wide range of topics, ranging from Art Characterization to the use of Synchrotrons, from Crops, Foods and Landscapes to Human Osteoarchaeology, and from Archaeological Materials to Digital Archaeology and Computation in Archaeology. Within this, we treat the term 'Archaeology' very broadly - a lot of studies address historical and cultural aspects more than strictly archaeological work. But this is one of the strengths and characteristics of ICAS-EMME: the ability to cross borders, to combine innovation in methods with original research questions, to break out from the strict disciplinary focus and to offer more comprehensive views on the lives and times of people past, regardless of whether the evidence we study and discover emerges from the soil through excavation, or has been kept above ground.

We are thrilled that for each session we were able to attract a senior scholar from outside Cyprus to be the chair, together with one of our own faculty affiliated to the Science and Technology in Archaeology and Culture Research Center (STARC) at the Cyprus Institute. The Chairs have been invited to start their sessions with a Keynote Lecture, and we look forward to a rich range of high-level presentations setting the scene for the subsequent oral presentations in each session. We had hoped to avoid parallel sessions altogether, to facilitate the interaction of speakers and audiences across the thematic sessions; however, the number of presentations received was such that we had to allow some parallel sessions to run on the first day - and to ask numerous colleagues to present their research as posters instead of oral presentations.

For many years, Professor Sturt Manning of Cornell University has been closely associated with STARC, both as a critical friend and Chair of the Scientific Expert Panel regularly evaluating our work, and as a scientific collaborator and leading archaeologist. We are very grateful and deeply honoured that he accepted our invitation to present Tuesday's Public Keynote Lecture on *'Time, History and Climate in Cyprus: the Cyprus Dendrochronology Laboratory and recent progress'*.

The Hellenic Society for Archaeometry (HSA) is the largest and longest-established relevant professional organisation in the Eastern Mediterranean, providing a forum for colleagues not only in Greece to exchange ideas and information, and promoting the application of Science and Technology in Archaeology, History of Art and Cultural Heritage. We are pleased and honoured that the members of their Board accepted our invitation to present a Public Keynote Lecture on the final day of ICAS-EMME, delivered by Dr Vassilis Kilikoglou.

A conference such as this doesn't pop into existence just like that. It took numerous people and organisations to make this happen, and each and every one whom we asked has offered generously of their time, experience, and contacts. We are also proud that this event has come together as a joint effort from across the archaeological community in Cyprus. While the Cyl acted as the nucleus and physical host of the event, our friends and colleagues of the Archaeological Research Unit of the University of Cyprus and the Cyprus American Archaeological Research Institute have enthusiastically accepted our invitation to co-organise ICAS-EMME 2, and the Department of Antiquities not only encouraged us with our combined effort, but also very generously offered the guided tour for our international visitors on Friday morning, and free entrance to the Cyprus Museum for all participants upon presentation of the registration badge.

Special mention should be made of the A.G. Leventis Foundation. Since their inception they have been the leading philanthropic organisation supporting archaeological and cultural heritage work in Cyprus, and Cypriot Archaeology and Heritage worldwide. Their endowment of the A.G. Leventis Chair in Archaeological Sciences

at the Cyprus Institute last year was a key enabler of this conference, and we are most grateful for their enduring support of our common cause. The extraordinary generosity of the Foundation towards all of us cannot be over-emphasized, and is deeply appreciated.

Funding for the conference was provided by the Cyprus Institute as well as by the European Union through the H2020 project **Promised** – *Promoting Archaeological Science in the Eastern Mediterranean*. This Twinning project links the Cyprus Institute with advanced experienced partners at the University of Cambridge and the KU Leuven. Among the activities organised under **Promised** are Short Courses, Summer Schools, mentoring and training visits, and public outreach events in Cyprus, the UK and Belgium - and the organization of ICAS-EMME 2.

Finally, on behalf of the Organising Committee we want to thank all those who made the conference happen on a practical level, particularly Andriani Loui, Giusi Sorrentino, Kyriaki Tsirtsis, Meghna Desai, and Yiannis Trimithiotis, with further support from Cagla Elektrikci, Charis Hephaestou, Evi Margaritis, Nic Jarraud, Pavlos Tsiartas, and many more.

Thilo Rehren, Artemios Oikonomou and Kirsi Lorentz

PROGRAM

Monday 11th of November 2019

18:30-21:30	Welcoming reception at Cyprus American Archaeological Research Institute (CAARI) [11 Andreas Demetriou Street, Nicosia 1066] Pre-registration
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Tuesday 12th of November 2019

08:30-09:00	Registration (NTL Building)
09:00-09:30	Opening ceremony (NTL Building) Prof. Thilo Rehren, A.G. Leventis Professor of Archaeological Sciences Dr Lindy Crewe, Director, CAARI Prof. Vasiliki Kassianidou, ARU Dr Marina Solomidou-Ieronymidou, Director, DoA Mr Theodosios Tsiolas, Permanent Secretary, GDEPCD

Session I Frontiers in Digital Archaeology (NTL Building)

Chairs: Prof. F. Niccolucci, Dr S. Hermon

09:30-10:00	Keynote lecture: <i>Challenges in Digital Archaeology</i>	Prof. Franco Niccolucci
10:00-10:20	FDA1: A LIVING SHIPWRECK: A composite study of scrambling devices: three-dimensional modelling and biological analysis for the understanding of site formation processes in archaeological shipwreck sites	M. Secci, S. Demesticha, C. Jimenez, I. Katsouri, B. Stivarou
10:20-10:40	FDA2: From excavation to the drawing and from drawing to the model. The digital reconstruction of twenty years excavations in the archeological site of Bedriacum	S. Parrinello, F. Galasso
10:40-11:00	FDA3: The identification of cities in archaeology: A case study from central Israel, the seventh-eleventh centuries AD	H. Nol
11:00-11:20	FDA4: Knowledge-based generative adversarial networks for scene understanding in cultural heritage	R. Garozzo, C. Pino, C. Santagati, C. Spampinato, G. Vecchio
11:20-11:40	Coffee break	
11:40-12:00	FDA5: Digital reconstruction and visualization of a New Kingdom palace area from the eastern Nile Delta/Egypt	I. Hein, S. Müller
12:00-12:20	FDA6: HBIM Approach for the knowledge and documentation of the St. John the Theologian Cathedral in Nicosia (Cyprus)	N. Bakirtzis, S. Hermon, C. Laurini, D. Papacharalambous, G. Sanfilippo, C. Santagati
12:20-12:40	FDA7: 3D Geometric descriptors for the study of Cypriot coroplastic production	V. Vassallo, A. Scalas, M. Mortara M., S. Hermon
12:40-14:00	Lunch break	POSTER SESSION I
14:00-14:20	FDA8: SimpleX: Towards an Ontology for Archaeological Pottery	Ch. Paraskeva
14:20-14:40	FDA9: Towards a Phygital Heritage approach for Museum Collection	M. Lo Turco, P. Piumatti, M. Calvano, E.C. Giovannini, N. Mafrici
14:40-15:00	FDA10: Machine Learning approach for monitoring and managing museum collections	F.M. La Russa, C. Santagati
15:00-15:20	Coffee break	

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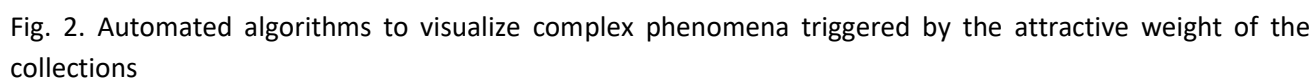
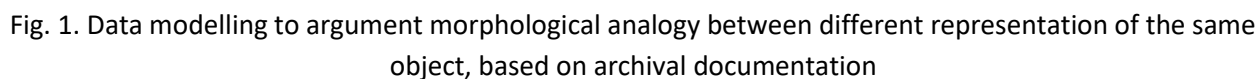
Massimiliano Lo Turco ⁽¹⁾, Paolo Piumatti ⁽¹⁾, Michele Calvano ⁽¹⁾, Elisabetta Caterina Giovannini ⁽¹⁾,
Noemi Mafrici ⁽¹⁾

(1) Politecnico di Torino, Department of Architecture and Design (DAD)

The Cultural Heritage field is the community that first faced the issue of digitization processes and tried to introduce the culture of transparency in the knowledge description. Passing from Cultural Heritage (CH) to Digital Heritage (DH) domain, the possibilities of creating, communicating and sharing knowledge are values that must be preserved, documented and made accessible. The CIDOC Conceptual Reference Model (CRM) established guidelines for the information exchange between CH institutions. Starting from the London Charter for the computer-based visualization of CH to the International Principles of Virtual archaeology, the role of paradata documentation became crucial to describe information about human processes of understanding and interpretation of data.

The BACK TO THE FUTURE research (Politecnico di Torino - Museo Egizio of Turin collaboration), proposes a graph about reproducible science in DH, documenting historical research: not just working about non-linear spatial narratives for 3D models platforms, but a rethinking of data structure using the advanced data modeling approach of an event-centric documentation model, according with the CIDOC CRM and its extensions.

This research offered interesting aims for working on the crucial relationship between content (collection) and container (museum) through shared and interoperable digital workflows. The artworks are characterized by intangible values including historical, artistic, social and media attributes and their weighted relationship helps to create an attractive weight of the artwork within the exhibition project. Therefore, it is an interesting subject for a correct foreshadowing of visitor flows. The recent launched SMART MUSEUM research works on automated procedures to show, through graphics, the complex phenomena triggered by the attractive weight of the collections. The involved elements are the exhibition area (the graphic field), the collection (the attractive elements) and the users. The conceived procedure, once automated, becomes a prototype to support the curators to control and improve the efficiency of the exhibition layout.



References

Lo Turco, M., Calvano, M. and Giovannini, E. C., 2019. Data modeling for museum collections. *Int. Arch. Photogramm. Remote Sens. Spatial Inf. Sci.*, XLII-2/W9, 433-440. doi.org/10.5194/isprs-archives-XLII-2-W9-433-2019.

